



GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

ELECTRICAL AND MECHANICAL SERVICES DEPARTMENT

3 KAI SHING STREET, KOWLOON, HONG KONG

**Sample Specifications for
Engagement of Registered Lift Contractor for Carrying out Lift Modernisation Works**

VERSION – JUL 2017

DISCLAIMER

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NOTES TO RESPONSIBLE PERSONS FOR LIFTS FOR ADOPTING SAMPLE SPECIFICATIONS

These sample specifications serve to assist responsible persons for lifts (“responsible persons” hereafter), e.g. building owners and management agencies, to engage registered lift contractor for carrying out the seven items of lift modernisation works as suggested in the “Guidelines for Modernising Existing Lifts” issued by EMSD.

Responsible persons may consider using some of the terms and conditions contained in these sample specifications for preparation of their own procurement documents for engaging registered lift contractors for carrying out lift modernisation works.

This document is not meant to suit the needs of all responsible persons, and therefore should not be indiscriminately adopted. Responsible persons must carefully consider their own circumstances, needs and budget, and adjust the specifications according to their own desired performance levels. Circumstances to consider may include specific user requirements on addition/replacement of relevant associated lift components/equipment, provision of method statement for works, carrying out risk assessment for works, to name but a few.

On the other hand, responsible persons are recommended to consult their registered lift contractors to review if any energy saving measures of the lift system could be implemented together with the lift modernisation works in one go.

[Note: The text in *italic* shall be inputted by the responsible persons for lifts to suit their own needs.]

PARTICULAR SPECIFICATIONS FOR ENGAGEMENT OF REGISTERED LIFT CONTRACTOR FOR CARRYING OUT LIFT MODERNISATION WORKS

1. Definitions and Interpretation

1.1 The following definitions and interpretation shall be adopted in these sample specifications:

- "Contract" means the quotation and the acceptance thereof by way of services order or letter of acceptance by the Employer, including the Specifications, drawings, documents of pricing/conditions and other relevant documents as included in the tender.
- "Contractor" means the person, firm or company whose quotation has been accepted by the Employer and includes the Contractor's personal representatives, and successors.
- "Employer" means *XXX (Name of the entity of responsible person)*.
- "Site" means the lands and other places provided by the Employer for the purpose of the execution of the Works.
- "Specification" means the specifications referred to in the Contract and any modification thereof or addition thereof as may from time to time be furnished or approved in writing by the Employer.
- "Works" means all the works and tasks to be executed, supplied and/or carried out by the Contractor under the Contract.

2. General

2.1 This Contract is to employ a registered lift contractor to carry out lift modernisation works for the lifts as included in Section 3 with the scope of works as specified in Section 4. The equipment installed in the lift modernisation works shall be in compliance with the requirements as specified in Section 5.

2.2 The registered lift contractor as specified in Clause 1.1 above means the contractor who is registered for carrying out lift works under the Lifts and Escalators Ordinance, Chapter 618 and whose registration is in force.

3. Legislations, Standards, Codes and Memoranda

3.1 The Contractor shall make reference to the latest edition/version of following statutory requirements, site safety regulatory requirements, codes of practice, circulars, technical standards, publications and specifications in carrying out the Works:

- (a) Lifts and Escalators Ordinance (Cap.618), and other subsidiary legislation(s)

- (b) Electricity Ordinance (Cap.406), and other subsidiary legislation(s)
- (c) Occupational Safety and Health Ordinance (Cap.509), and other subsidiary legislation(s)
- (d) Factories and Industrial Undertakings Ordinance (Cap.59), and other subsidiary legislation(s), including but not limited to Construction Site (Safety) Regulation
- (e) Code of Practice on the Design and Construction of Lifts and Escalators issued by Electrical and Mechanical Services Department, Government of the Hong Kong Special Administrative Region
- (f) Code of Practice for Lift Works and Escalator Works issued by Electrical and Mechanical Services Department, Government of the Hong Kong Special Administrative Region
- (g) Code of Practice for Energy Efficiency of Lift and Escalator Installations issued by Electrical and Mechanical Services Department, Government of the Hong Kong Special Administrative Region
- (h) Code of Practice on the Design and Construction of Buildings and Building Works for the Installation and Safe Use of Lifts and Escalators issued by Building Authority, Government of the Hong Kong Special Administrative Region
- (i) Code of Practice for Safety at Work (Lift & Escalator) issued by Labour Department, Government of the Hong Kong Special Administrative Region
- (j) Code of Practice for the Electricity (Wiring) Regulations published by Electrical and Mechanical Services Department, Government of the Hong Kong Special Administrative Region
- (k) Code of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment issued by Fire Services Department, Government of the Hong Kong Special Administrative Region
- (l) Circulars on Lifts and Escalators issued by Electrical and Mechanical Services Department, Government of the Hong Kong Special Administrative Region
- (m) Guidelines on Safety of Lift Shaft Works issued by Construction Industry Council
- (n) Electricity supply rules of the relevant power supply companies
- (o) Relevant National/International Standards and Codes of Practice

4. Sites of Works

4.1 The lifts involved under this Contract are summarized in the table below.

Location ID	Address
XXXXXXXX-XXX	ABC Building, ABC Street, Kowloon Bay, Kowloon
XXXXXXXX-XXX	ABC Building, ABC Street, Kowloon Bay, Kowloon
XXXXXXXX-XXX	ABC Building, ABC Street, Kowloon Bay, Kowloon

5. Scope of Works

5.1 The Contractor shall provide labour, materials, equipment, transportation and all other necessary resources for the design, manufacture, supply, delivery to Sites, dismantle existing equipment, erection, installation, testing and commissioning of the following seven items of lift modernisation works as suggested in the “Guidelines for Modernising Existing Lifts” issued by EMSD:

- (a) Double Brake System
- (b) Unintended Car Movement Protection Device
- (c) Ascending Car Overspeed Protection Device
- (d) Car Door Lock and Door Safety Edge
- (e) Intercom and CCTV System
- (f) Obstruction Switch to Protect Suspension Ropes
- (g) Automatic Rescue Device

5.2 In carrying out the lift modernisation works as specified in Clause 5.1, the Contractor shall provide, but not limited to, the following services in order to fully comply with all relevant statutory obligations and regulations (including the Lifts and Escalators Ordinance, Chapter 618) together with any amendments made thereto as required by all bodies and authorities for the safe and satisfactory standards of the Works. The Contractor shall arrange for all submissions and allow for all costs relating to statutory inspections and certificates as appropriate and as necessary.

- (a) Notification of commencement of works to EMSD (Form LE3);
- (b) Suspension of lift service;
- (c) Replacement of existing / addition of lift modernisation items;
- (d) Testing and commissioning;
- (e) Application for a resumption permit for resuming the use and operation of lifts after major alteration (Form LE7) with submission of associated documents;
- (f) Collection and posting of Resumption Permit (Form LE8); and
- (g) Resumption of lift service.

5.3 The Contractor shall co-ordinate the Works with building management’s representatives, Employer’s representatives, existing lift maintenance contractor as well as other Contractors and work agents, as appropriate, for satisfactory completion of the Works.

5.4 The Contractor shall provide relevant testing and commissioning report, as-fitted drawings and operation and maintenance manuals to the Employer or Employer’s representatives on completion of the Works for record.

6. Equipment and Installation Requirements

6.1 The equipment and installation requirements of the seven items of lift modernisation works as listed in Clause 5.1 shall comply with the followings as well as other relevant requirements in the latest version of the Code of Practice on the Design and Construction of Lifts and Escalators issued by EMSD (“the Design Code”):-

(a) Double Brake System

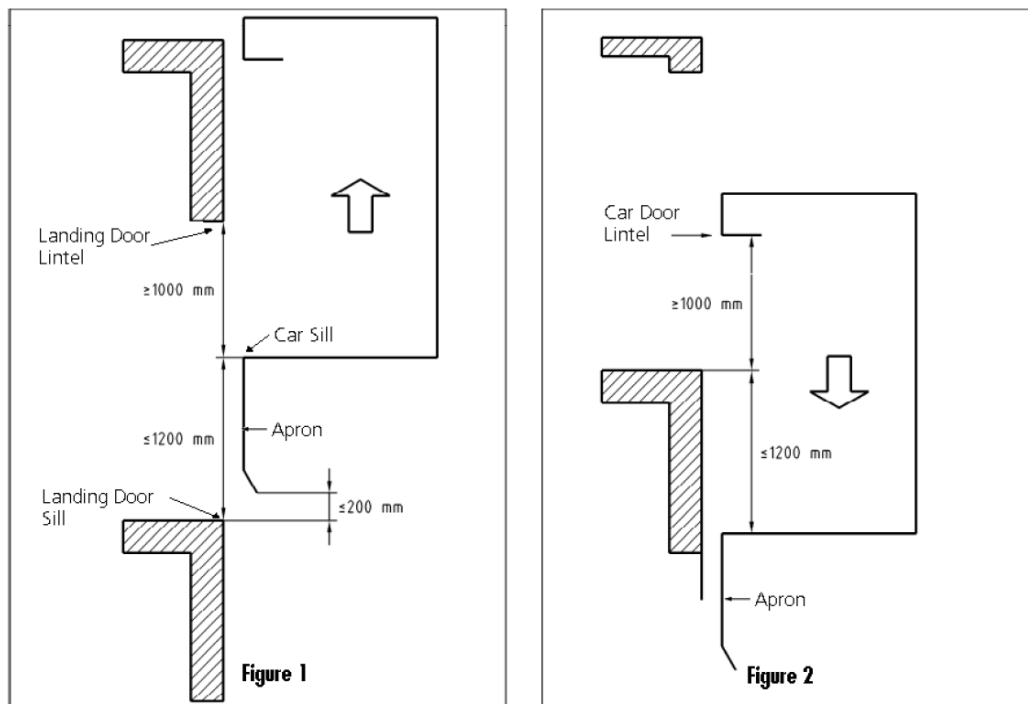
- (1) Each set of braking mechanism of the Double Brake shall be capable of

stopping the machine when the car is downward travelling at its rated speed and with the load equivalent to 125% (150% in case of industrial truck loaded freight lift and vehicle lift) of the rated load. It shall also be fitted with a manual emergency operating device capable of having the brake released by hand while a constant manual pressure is required to keep the brake open.

- (2) The component (i.e. brake drum or disc) on which the Double Brake System operates shall be coupled to the traction sheave (or drum or sprocket). Braking shall be effected by application on the brake drum or disc by at least two shoes, pads or callipers. The brake shoe pressure shall be exerted by guided compression springs or weights and of asbestos free material. The brake linings used shall be incombustible and of asbestos free material. In any case, band brakes are forbidden.
- (3) To hold off the Double Brake System, in normal operation, shall require a continuous flow of current to the brake coil. The interruption of this current shall be effected by at least two independent contactors, whether or not integral with those which cause interruption of the current feeding the lift machine.
- (4) The operation of each set of the braking mechanism of the Double Brake System shall be positively monitored to prevent further operation of the lift machine, when any one set of the braking mechanism is not functioning properly.

(b) Unintended Car Movement Protection Device

- (1) The Unintended Car Movement Protection Device shall be installed as a means to stop unintended car movement away from the landing with the landing door not in the locked position and the car door not in the closed position, as a result of failure in any single component of the lift machine or drive control system upon which the safe movement of the car depends, except failure of the suspension ropes or chains and the traction sheave or drum or sprockets of the machine.
- (2) The Unintended Car Movement Protection Device shall detect unintended movement of the car away from the landing and cause the car to come to a stop at the latest in a distance of 1200 mm as measured from the landing sill.
- (3) Subsequent to operation of the Unintended Car Movement Protection Device for an upward moving lift car, the clearance between the landing door sill and the apron of the stopped lift car shall not exceed 200 mm and the free distance from car sill to landing door lintel shall not be less than 1000 mm (See Figure 1).
- (4) Subsequent to operation of the Unintended Car Movement Protection Device for a downward moving lift car, the horizontal distance between the sill or entrance frame of the stopped lift car and the wall of the well, from the landing sill to 1200 mm downward, shall not exceed 150 mm and the free distance from landing sill to car door lintel shall not be less than 1000 mm (See Figure 2).



- (5) The Unintended Car Movement Protection Device shall be capable of performing as required in Clause 6.1(b)(1) without assistance from any lift component that, during normal operation, controls the speed or retardation, or stops the car, unless there is built-in redundancy and the correct operation is self-monitored.
- (6) The Unintended Car Movement Protection Device shall not allow a retardation of the car, with any load up to 100% of the rated load, in excess of $1 g_n$ (i.e. standard acceleration of free fall) during the stopping phase.

The Unintended Car Movement Protection Device shall conform to the requirements of Clauses 6.1(c)(4) - 6.1(c)(9) below.

The speed reducing element of the Ascending Car Overspeed Protection Device as specified in Clause 6.1(c) below may be used to serve the purpose of the Unintended Car Movement Protection Device.

- (7) The Unintended Car Movement Protection Device shall detect unintended movement of the car, cause the car to stop, and keep it stopped.
- (8) The stopping element of the Unintended Car Movement Protection Device, or the means keeping the car stopped may be common with those used for preventing overspeed in down direction, or preventing ascending car overspeed. The stopping elements of the means may be different for the down direction and for the up direction.
- (9) In case of using the machine brake as the Unintended Car Movement Protection Device, self-monitoring could include verification of correct lifting or dropping of the brake mechanism or verification of braking force. If a failure is detected, next normal start of the lift shall be prevented.

The Unintended Car Movement Protection Device is regarded as a safety component and shall be type tested to the requirements of Annex F.8 of

EN81-1, or other relevant international standards.

(c) Ascending Car Overspeed Protection Device

- (1) The Ascending Car Overspeed Protection Device, comprising speed monitoring and speed reducing elements, shall detect uncontrolled movement of the ascending car at a minimum of 115% of the rated speed, and maximum as defined in Clause 5.12.3 of the Design Code, and shall cause the car to stop, or at least reduce its speed to that for which the counterweight buffer is designed.
- (2) The Ascending Car Overspeed Protection Device shall be capable of performing as required in Clause 6.1(c)(1) above without assistance from any lift component that, during normal operation, controls the speed or retardation, or stops the car, unless there is built-in redundancy.

A mechanical linkage to the car, whether or not such linkage is used for any other purpose, may be used to assist in this performance.

- (3) The Ascending Car Overspeed Protection Device shall not allow a retardation of the empty car in excess of $1 g_n$ (i.e. standard acceleration of free fall) during the stopping phase.
- (4) The Ascending Car Overspeed Protection Device shall act to the car, to the counterweight, on the rope system (suspension or compensating), or on the traction sheave (e.g. on the sheave directly or on the same shaft in the immediate vicinity of the sheave).
- (5) The Ascending Car Overspeed Protection Device shall operate an electrical safety device in conformity with Clause 10.2 of the Design Code if it is engaged.
- (6) When the Ascending Car Overspeed Protection Device has been activated, its release shall require the intervention of a competent worker.
- (7) The release of the Ascending Car Overspeed Protection Device shall not require the access to the car or the counterweight.
- (8) After its release, the Ascending Car Overspeed Protection Device shall be in a condition to operate.
- (9) If the Ascending Car Overspeed Protection Device requires external energy to operate, the absence of energy shall cause the lift to stop and keep it stopped. This does not apply for guided compressed springs.
- (10) The speed monitoring element of the lift to cause the Ascending Car Overspeed Protection Device to actuate shall be, either a governor conforming to the requirements of Clause 5.12 of the Design Code, or, a device conforming to Clauses 5.12.2, 5.12.3, 5.12.7, 5.12.8, 5.12.9, 5.12.12 of the Design Code, and where equivalence to 5.12.4, 5.12.6 and 5.12.10 of the Design Code is assured.
- (11) The Ascending Car Overspeed Protection Device is regarded as a safety component and shall be type tested to the requirements of Annex F.7 of EN81-1, or other relevant international standards.

(d) Car Door Lock and Door Safety Edge

- (1) The Car Door Lock shall be provided such that every car door shall be mechanically locked by at least 7 mm such that it can only be opened in the unlocking zone of a landing. Such locking shall be proved by an electrical switch which shall prevent the lift car from being started or kept in motion unless all car doors are closed.
- (2) The Door Safety Edge shall be provided which shall automatically initiate re-opening of the door in the event of a person being struck (or about to be struck) by the door in crossing the entrance during the closing movement.
- (3) The effect of the Door Safety Edge may be neutralized during the last 50 mm of travel of each door panel.
- (4) In the case of a system which makes the Door Safety Edge inoperative after a fixed period of time, to counteract persistent obstructions when closing the door, the kinetic energy defined above shall not exceed 4 J and an audible alarm shall sound during movement of the door with the Door Safety Edge inoperative.
- (5) A single beam light ray alone is considered insufficient for the Door Safety Edge.
- (6) For the Door Safety Edge, a door re-open button shall be provided on the car operating panel, which, upon activation, shall initiate re-opening of the door.
- (7) The detection equipment of the Door Safety Edge for persons with a disability shall be positioned at a height of not less than 500 mm and not more than 600 mm above the floor of the car, to initiate re-opening of the door in the event of a person who is about to be struck.
- (8) For the Door Safety Edge for persons with a disability, forced-closing system as described in Clause 6.1(d)(4) shall not be provided.

(e) Intercom and CCTV System

- (1) An emergency alarm push button together with a buzzer (or an alarm bell), an intercom and a closed circuit television (CCTV) camera shall be provided in the lift car and be connected to the building management office or the caretaker's office, and the machine room (or the maintenance access panel locating at the top floor for the machine room-less lift). The building management office or the caretaker's office, and the machine room shall each be equipped with a buzzer (or an alarm bell), indication light(s) (one for each lift), an intercom and a CCTV monitor connected to the lift car(s). An alarm bell connected to the alarm push button in the lift car shall also be provided at the main entrance lift lobby or lift pit.
- (2) If the intercom or the CCTV monitor in the building management office, the caretaker's office or the machine room serves more than one lift or other location, a selection switch (or similar device) shall be provided.
- (3) Appropriate notices (in English and Chinese) shall be displayed next to all the equipment provided under this Clause 6.1(e), indicating the function and/or

operation of them.

- (4) All the equipment, except CCTV, under this Clause 6.1(e) shall be backed up by the emergency supply or an equivalent supply.
- (5) The buzzers (or alarm bells) shall ring and the indication lights shall be lit if the alarm push button is pressed. The indication lights shall remain on until they are manually reset by activation of a reset switch inside the building management office or the caretaker's office upon releasing of trapped passengers. The hook switch of an intercom handset shall not be used as the indication lights reset switch.
- (6) The sound generated by the buzzers (or alarm bells) shall be distinguishable from that of fire alarms.
- (7) If there is no building management office or caretaker's office in the building, the indication light(s), reset switch, intercom and CCTV monitor shall be placed at the main entrance lift lobby. A buzzer (or alarm bell, in addition to the one provided at the main entrance lift lobby or lift pit) and indication light(s) (one for each lift) shall also be provided at a remote location with 24-hour attendance and backed up by an emergency supply for at least 2 hours.
- (8) For a lift provided for persons with a disability, in addition to the equipment under Clause 6.1(e)(1) - 6.1(e)(7) above, an indication light for acknowledgement shall be provided in the lift car. The indication light for acknowledgement shall be in the form of a blinking light adjacent to the intercom speaker and a notice "When light blinks, it indicates your emergency call has already been received. Please be patient and wait for the rescue" (in English and Chinese) shall be provided next to the blinking light.

The indication light for acknowledgement shall blink after the manual activation of an acknowledgement switch located in the building management office or the caretaker's office, or if there is no such office, at the main entrance lift lobby. The blinking shall continue until the acknowledgement switch is reset.

(f) Obstruction Switch to Protect Suspension Ropes

- (1) The Obstruction Switch to Protect Suspension Ropes shall be installed to protect human and the equipment when the car or counterweight meets an obstruction when moving downwards.
- (2) For positive drive lifts, the Obstruction Switch to Protect Suspension Ropes shall be able to open the control circuit and cause the lift to stop if the car (or counterweight) meets an obstacle when moving downwards.
- (3) For traction drive lifts, the Obstruction Switch to Protect Suspension Ropes shall be able to cause the lift to stop, and keep it stopped, if when a start is initiated, the lift machine does not rotate, or, the car (or counterweight) is stopped in downward movement by an obstacle which causes the ropes to slip on the traction sheave.

This device shall function in a time which does not exceed the smaller of 45 seconds, or, the time for travelling the full travel, plus 10 seconds, with a

minimum of 20 seconds if the full travel time is less than 10 seconds.

The Obstruction Switch to Protect Suspension Ropes shall not affect the movement of the car under either the inspection operation or the emergency electrical operation.

(g) Automatic Rescue Device

- (1) The Automatic Rescue Device shall detect both voltage dip and power interruption. On detecting either of these circumstances, it shall use back-up battery power to move the lift to the nearest landing floor and open the car and landing doors to release the passengers. The Automatic Rescue Device shall then cause the lift to remain out of service until normal power supply is resumed.
- (2) The normal operation of the lift is desirable to be made resumed after the restoration of the normal power supply. However, the lift shall not restart, if further lift operation will lead to a dangerous situation.

7. Health and Safety Requirements

- 7.1 The Contractor shall take all health, safety and environmental protection measures/precautions comply with all the relevant statutory requirements while carrying out the Works.
- 7.2 The Contractor shall enhance with priority accorded in all activities connected with the Works, the safety and health of all persons on or adjacent to the Sites and to ensure that in particular all persons employed on the Works are appropriately trained for their tasks with consideration given to safety and health issue.
- 7.3 The Contractor shall provide workers and any persons working at the workplace with adequate and appropriate Personal Protective Equipment (PPE) as stipulated in the Factories and Industrial Undertakings Ordinance, Chapter 59, and shall take reasonable steps to ensure that the workers or persons working at the workplace make full and proper use of the same.

8. Working in Confined Space and Working at Height

- 8.1 The Contractor shall provide workers and any persons working in Confined Space and those working at height with adequate and appropriate Personal Protective Equipment (PPE) and shall strictly comply with all statutory requirements in relation to work safety as stipulated in the Factories and Industrial Undertakings Ordinance, Chapter 59.